

28

Notice of Allowability	Application No.	Applicant(s)	
	10/826,304	WU, SHYE-LIN	
	Examiner	Art Unit	
	Thomas L. Dickey	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 10/26/2005.
2. ☒ The allowed claim(s) is/are 14, 15, 18 and 19.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
|---|--|

Art Unit: 2826

REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

Claims 14,15,18, and 19 are allowed over the references of record because none of these references disclosed or can be combined to yield the claimed invention such as a power rectifier device, comprising an n+ substrate having a n-drift layer formed thereon; a cathode metal layer formed on a surface of said n+ substrate opposite said n-drift layer; an active region having a metal silicide layer formed thereon; a termination region being defined at positions outer of said active region; an insulating layer formed on said n-drift layer and on said termination region; four first trenches along a line and filled with an un-doped polycrystalline silicon layer spaced from each other and the second and the third of said trenches formed into said n- drift layer of said substrate, and the first and the fourth of said trenches formed into said insulating layer and said n- drift layer of said substrate; said active region being defined from a first interval to a second interval, wherein said first interval is in between the first one and the second one of said first trenches, and said second interval is in between the third one and the fourth one of said first trenches; a thermal oxide layer formed on said termination region; an anode electrode formed on metal silicide layer and extended to cover the first and the fourth of said first trenches, wherein said insulating layer is a stack layer, from said epi-layer

Art Unit: 2826

sequentially, formed of a first oxide layer, a nitride layer, and a second oxide layer having respective thicknesses between about 5 to 100 nm, 50-300 nm, and 0 to 1000 nm, as recited in claim 14.

Chang et al. 2002/0008237 discloses a power rectifier device with an n⁺ substrate 10 having a n-drift layer 12 formed thereon; a cathode metal layer 34 formed on a surface of said n⁺ substrate 10 opposite said n-drift layer 12; an active region (no part #; it is found within the range defined by termination region 22) having a metal silicide layer 32 formed thereon; a termination region 22 being defined at positions outer of said active region; an oxide (field oxide. Note, paragraph 17 and in keeping with claim 15, that part of the field oxide above the first and fourth trenches has been removed) layer insulating layer 16 formed on said n-drift layer 12 and on said termination region 22; four first trenches 29 along a line and the second and the third of said trenches 29 formed into said n- drift layer of said substrate 10, and the first and the fourth of said trenches 29 formed into said insulating layer 16 and said n- drift layer of said substrate 10; said active region being defined from a first interval to a second interval, wherein said first interval is in between the first one and the second one of said first trenches 29, and said second interval is in between the third one and the fourth one of said first trenches 29; a thermal oxide layer 14 formed on said termination region 22; an anode electrode 36 formed on metal silicide layer 32 and extended to cover the first and the

Art Unit: 2826

fourth of said first trenches 29. Note figure 9 and paragraphs 0016-0022 of Chang et al. Further, Kocon 2004/0256690 discloses a power rectifier device with four first trenches 210(a)-(d) filled with an un-doped polycrystalline silicon layer 212. Note figure 2 and paragraphs 0038-0043 of Kocon.

However, Chang et al. and Kocon neither disclose nor suggest that the insulating layer should be a stack layer, from said epi-layer sequentially, formed of a first oxide layer, a nitride layer, and a second oxide layer having respective thicknesses of between about 5 to 100 nm, 50-300 nm, and 0 to 1000 nm.

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

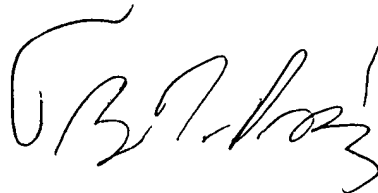
Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

Art Unit: 2826

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'T. L. Dickey', with a stylized flourish at the end.

Thomas L. Dickey
Patent Examiner
Art Unit 2826
12/05